



Goddard Procedural Requirements (GPR)

DIRECTIVE NO.	<u>GPR 8715.8A</u>	APPROVED BY Signature:	<u>Original Signed By</u>
EFFECTIVE DATE:	<u>February 23, 2015</u>	NAME:	<u>Judith N. Bruner</u>
EXPIRATION DATE:	<u>February 23, 2020</u>	TITLE:	<u>Director, Safety and Mission Assurance</u>

COMPLIANCE IS MANDATORY

Responsible Office: 360/Safety Division

Title: Fall Protection Requirements for GSFC

PREFACE

P.1 PURPOSE

This directive sets forth the minimum fall protection requirements within the framework of Goddard Space Flight Center's (GSFC) safety policies and constraints. It does not replace Occupational Safety and Health Administration (OSHA) regulations, National Aeronautics and Space Administration (NASA), GSFC, or contractor safety programs requirements, except where this policy is more stringent. This policy does not attempt to repeat OSHA, but rather define GSFC's additional fall protection requirements. It is not an instruction manual for untrained personnel, nor is it a substitute for detailed procedures judged necessary for the safe conduct of a specific task involving fall hazards by qualified and competent persons.

P.2 APPLICABILITY

This directive applies to all GSFC personnel, facilities, and activities at all permanent and temporary sites. This directive also applies to all GSFC tenant organizations, contractors, grantees, clubs, and other persons operating on GSFC property as required by law and as directed by contractual, grant, and agreement documents.

The term "Safety Office" applies equally to the safety offices at both Greenbelt (Code 360) and Wallops Flight Facility (Code 803).

P.3 AUTHORITIES

- 29 CFR 1910, Occupational Safety and Health Administration (OSHA) General Industry Standards
- 29 CFR 1926, OSHA Construction Industry Regulations
- NPR 8715.3, NASA General Safety Program Requirements

P.4 APPLICABLE DOCUMENTS

- 29 CFR 1910 Subpart D, Walking Working Surfaces
- 29 CFR 1926 Subpart M, Fall Protection
- 29 CFR 1960.73, Retention of Records
- GPR 1400.1, Waiver Processing

CHECK THE GSFC DIRECTIVES MANAGEMENT SYSTEM AT
<http://gdms.gsfc.nasa.gov> TO VERIFY THAT THIS IS THE CORRECT VERSION PRIOR TO USE.

e. ANSI/ASSE Z359, Fall Protection Code series

P.5 CANCELLATION

GPR 8715.8-, Fall Protection Requirements for GSFC

P.6 SAFETY

As described throughout this directive.

Any safety waivers to requirements listed in NPR 8715.3 paragraph 3.18 or GPR 8715.8, shall be completed in accordance with GPR 1400.1.

P.7 TRAINING

Training requirements are defined in Section 12 of this document.

P.8 RECORDS

Record Title	Record Custodian	Retention
Records of Fall Protection Training	Civil Servants: Office of Human Resources and/or Supervisor On-site Contractors: Company retains records. Instructors: Training Center or contractor retains training history for certification and retraining credential traceability	<u>NRRS 3/33C</u> – Destroy or delete 5 years after separation of employee or when no longer needed, whichever comes first.
Fall Protection and Rescue Procedures	Document Owner	<u>NRRS 23.5A (10)</u> – Destroy 5 years after issuance of a new plan or procedure

**NRRS – NASA Records Retention Schedules (NRRS 1441.1)*

P.9 MEASUREMENT/VERIFICATION

The Safety Office will gather metrics from the following activities and analyze them for trends and lessons learned:

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- a. Audits/inspections of work at height operations to ensure organizational program compliance; and
- b. Review of close calls, lost-time incidents, and property damage due to falls from greater than four feet in order to prevent future occurrences.

PROCEDURES

In this document, a requirement is identified by “shall,” a good practice by “should,” permission by “may” or “can,” expectation by “will,” and descriptive material by “is.”

1. ROLES AND RESPONSIBILITIES

1.1 The Center Director will:

- a. Implement a Center fall protection program to protect all Government employees, contractors, subcontractors, international partners, and persons who are exposed to falls while performing GSFC related work.
- b. Ensure that the Center’s fall protection program complies with the requirements of 29 CFR 1910, General Industry, and 29 CFR 1926, Construction Industry; utilizes as *guidelines* (these versions), ANSI/ASSE Z359, Fall Protection Code series (Z359.0, Z359.1, Z359.2, Z359.3, and Z359.4; and complies with any more stringent requirements necessary for the Center's specific fall hazards.
- c. Designate in writing a Center Fall Protection Program Administrator who is responsible for the development, implementation, and management of the Center’s fall protection program. Ensure that the designated Center Fall Protection Program Administrator has a working knowledge of current fall protection regulations, standards, and fall protection equipment and systems and the skills, experience, and abilities to effectively manage the Center’s fall protection program.

1.2 Fall Protection Program Administrator shall:

- a. Have the skills, experience, and abilities to ensure effective management of the employer’s fall protection program. This would include a working knowledge of current fall protection regulations, standards, fall protection equipment, and systems.
- b. Implement and coordinate the Center’s fall protection program.
- c. Evaluate the Center-wide hazards, determine where protection from falls from elevation is required, and establish any additional, more stringent requirements necessary to protect against Center-specific fall hazards.
- d. Provide guidance and oversight to ensure that NASA fall protection requirements are included in contracts where contractor employees of the acquisition will be working in situations that require fall protection.
- e. Provide oversight to ensure that NASA fall protection requirements are included in work instructions where individuals will be working in situations that require fall protection.
- f. Provide oversight to ensure that anyone who is identified as a qualified person (per ANSI/ASSE Z359.0) to serve as a subject matter expert in support of the Center's fall protection program, has an engineering degree or access to a person with an engineering degree to identify and to evaluate

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unique situations and “non-standard equipment” and has been trained by an industry-recognized trainer, NASA-recognized trainer/training center, or NASA-developed training program equivalent to ANSI and OSHA compliant training.

- g. Provide oversight to ensure that, for each situation that requires fall protection at the Center (NASA or contractor led), there is a competent person assigned responsibility for the immediate application of fall protection work where fall protection is required whose education and training meet requirements as defined in Section 12. Remain current with changing OSHA and ANSI fall protection requirements, NASA, local laws, and new fall protection systems.
- h. Conduct an annual review and audit of the Center’s fall protection program to ensure compliance. Use of new technology, regulations, third party audits, and industry practices should be considered during the annual review and audit. Notify the GSFC community of identified lessons learned, mishaps and recalls of fall protection equipment.

1.3 A Qualified Person shall:

- a. Be formally identified by the Fall Protection Program Administrator and support the program administrator, competent and authorized persons, and the fall protection program by supplying technical information and serve as a subject matter expert.
- b. Provide information to the authorized and/or competent person when selection of an appropriate non-engineered anchorage for a fall arrest or fall restraint system has not been accomplished.
- c. Design and document any permanent anchorage, fall arrest system, fall restraint system, or lifeline (vertical and/or horizontal).
- d. Be familiar with fall protection practices, equipment, regulations, engineering principles, and the effects that permanent fall protection systems will have on the surrounding structure.
- e. Be trained in accordance with Section 12.

1.4 Competent Person(s) shall:

- a. Be identified, in writing, by their respective employer, and be responsible for the immediate application of fall protection work where fall protection is required.
- b. Be knowledgeable of applicable fall protection regulations, standards, equipment and systems, and mandatory requirements for fall protection equipment and systems used by their employers.
- c. Have work experience related to the application of fall protection.
- d. Utilize the preference order of controls in Section 2 to identify appropriate protective measures based on risk that effectively protect personnel from falls.
- e. Have the ability to identify unsafe conditions or practices as they relate to fall protection during the course of the work and have the authority to take prompt corrective action.
- f. Be a resource to authorized persons for fall protection issues.
- g. Assist authorized persons when requested to ensure that non-engineered anchorages selected are acceptable, fall protection system(s) will work as intended, fall protection equipment is inspected prior to use, fall protection systems are used in accordance with manufacturer recommendations, OSHA requirements, qualified person designs, and local policy, and rescue plans are in effect.
- h. Ensure fall hazard assessment has been completed for all task exposing personnel to falls from heights and adequate controls based on risk have been identified.

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- i. Perform competent person fall protection equipment inspections in accordance with manufacturer specifications and maintain records documenting completion.
- j. Ensure new facilities, processes, equipment and operations are assessed for fall hazards during the design phase and controls implemented in the order of preference based on risk.
- k. Be trained in accordance with Section 12.

NOTE: Non-engineered anchorages can be selected by a competent person, providing the competent person can predict the arresting force (<900 pounds) and the total required clearance of the system.

1.5 Authorized Person(s) (User) shall:

- a. Protect their self by applying fall protection practices during the course of their work.
- b. Understand the fall hazards associated with all assigned work tasks and the proper application of fall protection controls.
- c. Receive formal classroom training in fall protection from a competent or qualified person before they use fall protection systems or are exposed to a fall hazard.
- d. Inspect, install, use, maintain, store, and dismantle fall protection equipment according to manufacturer instructions, OSHA requirements, and local policy.
- e. Notify a competent person for determination of the appropriate action to be taken when conducting any work where required fall protection is not in place, fall protection equipment has been found defecting or subject to a fall, or the performance of the fall protection system is unpredictable.
- f. Receive and maintain training per Section 12.

1.6 Supervisors shall:

- a. Ensure that GSFC fall protection requirements are included in work instructions where employees and/or contractors will be working in situations that require fall protection.
- b. Ensure that anyone who is identified as a qualified person serving as a subject matter expert has been trained in accordance with Section 12.
- c. Ensure that a competent person is assigned responsibility for the application of fall protection where required.

2. FALL HAZARD CONTROLS

The following controls, in order of preference, shall be used:

- a. **Hazard Elimination:** The specific work that created the fall hazard should be evaluated to determine if a change in process, area, technology, or equipment would eliminate the fall hazard.
- b. **Guarding:** Physical barriers between the worker and the fall hazard can be established so the barrier prevents the worker from falling (i.e., guardrails, vertical netting, covers, etc.).

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- c. Fall Restraint: Fall protection personal protective equipment can be used to assemble a system (permanent or temporary) that will prevent a worker from reaching the fall hazard. Fall restraint must prevent a worker from falling any distance.
- d. Fall Arrest: Fall protection personal protective equipment can be used to assemble a system (permanent or temporary) that allows a worker to fall, but arrests the fall safely before the worker strikes the ground or surrounding structure.
- e. Administrative Controls: Administrative controls are reserved for situations where all other fall protection methods are deemed infeasible. The methods used for this plan shall conform to 29 CFR 1926.502. Administrative controls must be approved by a competent or qualified person.

NOTE: Safety Nets are not permitted to be used at GSFC.

3. FALL HAZARDS AND ASSESSMENTS

- a. Fall Protection shall be identified for Walking/Working Surfaces with unprotected edge/opening or other fall potential of 4 feet or greater for general and flight project work and 6 feet or greater for construction work.
- b. Projects/Contractors working at GSFC are required to develop a Fall Protection Plan (FPP) that will address project specific fall hazards that will be encountered while working at heights. This FPP (see Appendix C for a sample plan) will become a part of the project/contractor's overall Safety and Health Plan, which addresses the approach to implementing the requirements of this GPR and all applicable OSHA regulations. The FPP shall be available upon request.
- c. If a vehicle or trailer is used as a walking/working surface other than normal operational modes such as operation, maintenance, transport, loading, or off-loading, the need for fall protection shall be evaluated by a competent person.
- d. If work requires employees to be closer than 15 feet from any unprotected edge or opening greater than 12 inches, positive fall protection (Guardrail system or personal fall protection to include harness w/arrest or restraint system) or the use of other means such as vehicle mounted work platforms and/or scaffolding is required.

NOTE: Be cautious when using guardrails or chains as a means of positive fall protection. Such mechanisms may be subject to failure due to wear and tear and/or faulty design, construction, installation, and testing. Personnel should not lean on guardrails, gates, or chains. Guardrails must meet the requirements of 29 CFR 1910.23 and 29 CFR 1926.502 as appropriate.

- e. Horizontal Life Lines: Commercially available ANSI approved temporary horizontal life lines are to be installed per manufacturer's written instructions. Only a qualified person may change the instructions, and those changes are documented prior to use. If not commercially designed, then a qualified person must design and oversee installation.
- f. Over/Near Water Operations: If employees are required to work over/near water they shall be protected from falling as required by this policy and 29 CFR 1910 requirements. This section applies to construction activities, and is not intended to apply to marine operations that are governed by 29 CFR 1917, Subpart B, Marine Terminal Operations.
- g. Tower Climbing Operations: Climbing towers present unique hazards not associated with other jobs requiring fall protection.

Prior to tower climbing it is required that the following be addressed:

- (1) Assessment that the structure is safe to climb,
 - (2) Weather conditions,
 - (3) Development of a rescue plan and the selection of rescue equipment (if self-rescue is possible),
 - (4) Coordination with designated rescue entity,
 - (5) Safe transport of equipment/tools,
 - (6) Overhead power lines location,
 - (7) Tower energy sources have been properly locked and tagged out, and
 - (8) All climbers must be trained to climb towers and two climbers must be present during the operation.
- h. Roof Work - Fall Protection Requirements (only applies during roofing activities)
- (1) Low-sloped or flat roofs (less than or equal to a 4:12 pitch):
 - (a) From unprotected edge to 6 feet: Positive fall protection required.
 - (b) From 6 feet to 15 feet: In lieu of positive fall protection a warning line and safety monitor system may be used.
 - (c) Fifteen feet or more from unprotected edge: In lieu of positive fall protection, a warning line may be used without a monitor.
 - (2) Steep roofs (greater than a 4:12 pitch) require positive fall protection at all times.
- i. Roof Access - for non-roof work (All other activities on a roof such as those of mechanical trades)
- (1) Activities on low-sloped or flat roofs with a pitch less than 4:12 above 4 feet requires:
 - (a) From unprotected edge to 15 feet: Positive fall protection is required.
 - (b) From 15 feet to 30 feet: A warning line may be used with a designated safety monitor.
 - (c) 30 feet or more from unprotected edge: No warning line is required.
 - (2) All activities on steep roofs (greater than a 4:12 pitch) requires positive fall protection such as a personal fall arrest system (PFAS) or restraint system, guardrails or use of other means such as aerial lifts or scaffolding.
- j. Roof Inspections and Assessments:
- (1) Employees needing to access roofs for the sole purpose of performing roof inspections or assessments may do so only during pre and post construction work and shall follow the policy for "Roof Access."
 - (2) If access is required during construction activities, the policy for "Roof Work" applies.
- k. Fall hazards from any height to lower level shall require protection if the work is over a collateral hazard (e.g. moving machinery, chemicals, electrical hazards, impalement hazards).

4. FALL PROTECTION SYSTEMS

- a. Fall Restraint Systems shall be designed according to the following:
- (1) In accordance with OSHA and ANSI requirements.
 - (2) Prevent a worker from reaching the unprotected edge.
 - (3) Anchorage point must be able to hold 1,000 pounds.
 - (4) Utilize a full body harness, waist belts are prohibited.

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- b. Personal fall arrest systems (PFAS) shall be designed to meet the requirements set forth in the applicable OSHA subpart(s). ANSI Fall Protection Standards will be followed except where deemed inappropriate by a qualified person.
- c. When personal fall arrest systems are used they shall:
 - (1) Limit the free fall distance to no more than 6 feet.
 - (2) Have a maximum arresting force of 1800 pounds.
 - (3) Not violate the manufacturer instructions without written approval from a qualified person.
- d. If anchor points are being installed for workers other than the installer, a procedure shall be provided to ensure that the authorized user can determine that the system is approved for use. Acceptable anchorage structures may be I-beams, columns, tower legs, stairwell support structure, or other structure that is capable of holding 5,000 pounds per person or designed by a qualified person with a safety factor of 2.
- e. If the anchorage is questionable, the system shall not be used and a competent or qualified person should be notified. Handrails are not acceptable anchor points.
- f. Fall arrest system subjected to impact loading shall be immediately removed from service and returned for destruction.
- g. Fall arrest and restraint system components shall meet OSHA and ANSI Z359 Series standards.
- h. When using a Work Positioning System it shall:
 - (1) Be used in conjunction with an independently anchored fall protection system.
 - (2) Not permit a free fall of greater than 2 feet.

5. FALL PROTECTION EQUIPMENT SHALL BE:

- a. Selected from equipment meeting or exceeding the OSHA and ANSI Fall Protection Standards. All new fall protection equipment must meet ANSI Z359.1 current at the time of purchase.
- b. Used according to manufacturer instructions. Only a qualified person may change the instructions, and those changes are documented prior to use and maintained until the equipment is removed from service.
- c. Inspected in accordance with manufacturers recommendations; at a minimum pre- and post-use by the authorized user and in accordance with the manufacturer specifications, but not less frequent than annually by a competent person.
- d. Taken out of service if involved in a fall.
- e. Taken out of service and returned to the manufacturer if found to be defective.
- f. Taken out of service when the maximum lifetime for any component as set by the manufacturer is reached.
- g. Any equipment used for fall protection shall be withdrawn from use upon notification of a safety defect, alert or concern.
- h. Used as designed and under no circumstances used to hoist tools or other work materials.
- i. Designed for use as fall protection. Equipment not designed for fall protection use shall not be used without prior documented approval of a qualified person, and be labeled "For Fall Protection Use Only."

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6. MOBILE AERIAL PLATFORMS

Work conducted using equipment with horizontal and vertical movement (i.e. bucket type lifts) shall comply with the following:

- a. Active Fall Protection shall be used in accordance with manufacturer instructions for all ANSI/SIA A92.2 Vehicle-Mounted Elevating and Rotating Aerial Devices, ANSI/SIA A92.5 Boom-Supported Elevating Work Platforms, or any other equipment where hazards have not been guarded or as required by manufacturer operating procedures. Fall restraint is the preferred method of fall protection for use in these types of aerial platforms and should be used when feasible
- b. When Fall Restraint is not appropriate for the lift (e.g., manufacturer provided anchor point does not prevent a fall of any distance) or the task (e.g., transitioning from an aerial platform to another structure), a PFAS system must be used in accordance with the manufacturer specifications. In addition, worker must ensure the following conditions do not exist in the event of a fall:
 - (1) Selected PFAS does not allow worker to strike the next level, surrounding structures, or present swing hazard to worker;
 - (2) No sharp edges, burrs, or other conditions are present that could damage lanyard or other fall protection equipment resulting in a failure.
 - (3) Aerial lift or equipment and anchor are capable of sustaining the arresting force of the worker and PFAS selected.

If required to exit the work platform while at height 100% tie off is required and it is preferred the employee transition through the access gate.

7. SCISSOR LIFTS

Personal fall protection is not required while operating ANSI/SIA A92.3 and A92.6 Manually and Self Propelled Elevated Work Platforms (i.e. scissor lifts) that have vertical-only movement capability, and equipped with OSHA-approved handrails unless:

- (1) The lift manufacturer has provided a certified anchor point and requires the use of personal fall protection, or
- (2) The lift is not being used as intended, such as climbing on the handrails, or leaving the platform while it is elevated.

If employees are required to exit the work platform while at height 100% tie off is required and it is preferred the employee transition through the access gate.

Positive fall protection in accordance with the manufacturer instructions must be afforded for exempted equipment listed above when guard rails are removed.

8. LADDERS

- a. Fixed Ladders: Appropriate personal fall protection equipment shall be used when accessing fixed ladders equipped with fall protection systems such as cable grabs, or rails.

- b. Ladders without fall protection systems shall be constructed in accordance with 29CFR1910.
- c. Portable Ladders: Personal fall protection equipment is not required while using portable ladders. However, ladders do have the potential of being placed by an unprotected edge (example, person transitioning above guard rails), thus requiring the use of positive fall protection while utilizing a ladder. Personnel using portable ladders should maintain proper body positioning while on the ladder, and if the ladder cannot be secured should employ the use of a second person to shore the base of the ladder. Ladders shall be setup, used, and maintained in accordance with manufacturer operating instructions.

9. SCAFFOLD

Scaffolding shall be:

- a. Erected in accordance with OSHA and manufacturer requirements.
- b. Protected where the potential for a fall 4 feet or greater exists by the use of fall protection systems (guardrails, fall arrest, fall restraint).
 - (1) A qualified person may develop a fall protection plan for scaffolding up to 10 feet in height if fall protection systems are not feasible.
- c. Inspected and approved by a person trained to the level of competent person for scaffolding during erection and dismantling to determine if fall protection systems (guardrails, fall arrest, fall restraint) can be used. Any modifications to an erected scaffold will require the approval of a scaffolding competent person.
- d. A fall protection plan may be developed if the use of fall protection systems is not feasible

NOTE: A scaffolding-competent person is not the same as a fall protection-competent person.

10. FLIGHT PROJECT REQUIREMENTS

Flight hardware development and integration activities shall comply with OSHA General Industry fall protection requirements and controls when working on unprotected surfaces of greater than four feet.

11. WEATHER

Weather conditions should be reviewed prior to the start of outdoor work at heights and continuously monitored until the work is complete. The employer's competent person shall define unacceptable adverse weather conditions and cease work immediately if they occur. High wind conditions will be defined by the employer's competent person or by the manufacturer of equipment being used (whichever is most stringent).

12. TRAINING REQUIREMENTS

12.1 Fall Protection Program Administrator

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Program Administrators training shall include the following:

- a. Competent Person training,
- b. Developing and maintaining a managed fall protection program,
- c. Fall hazard surveys,
- d. Fall protection system selection,
- e. Development of required equipment purchase controls,
- f. Understanding of written fall protection and rescue procedures and plans,
- g. Understanding of fall protection engineering system standards,
- h. Use of Fall Protection Training equipment,
- i. How to remain current with changing requirements, laws, and new fall protection systems.

The Center Fall Protection Program Administrator shall remain current with changing OSHA and ANSI fall protection requirements, NPR 8715.3, local laws, and new fall protection systems.

Fall protection retraining shall occur at least every 2 years.

12.2 Qualified Person

Qualified person training shall include at least the following information:

- a. Fall hazard elimination and control methods,
- b. Applicable fall protection regulations,
- c. Inspection of equipment's components and systems,
- d. Selecting fall protection systems,
- e. Developing engineering system standards,
- f. Determining system clearance requirements,
- g. Designing and selecting anchorages,
- h. Determining when fall protection systems are infeasible,
- i. Designing new and evaluating existing horizontal lifelines,
- j. Assessing system component compatibility,
- k. Fall Protection system assessments and determining when a system is unsafe,
- l. Analyzing various anchorages,
- m. Developing written fall protection procedures and rescue procedures,
- n. Determining swing fall arresting forces,
- o. Determining potential fall arresting forces,
- p. Investigating fall protection related accidents/incidents/near misses

Qualified person fall protection retraining shall occur at least every two years.

12.3 Competent Person

Competent person education and training shall be administered by an industry recognized trainer, training center, or locally developed Training Program equivalent to ANSI and OSHA compliant training, and include the following as a minimum:

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- a. Use of all types of equipment and systems used in locations where the authorized persons work, including inspecting systems prior to use.
- b. Installation, component compatibility, estimating free-fall distances, total required clearance, dismantling, storage, and the common hazards associated with each system.
- c. Fall hazard elimination and controls methods.
- d. Applicable fall protection regulations.
- e. Development of written fall protection procedures and plans.
- f. Understanding of fall protection engineering system standards.
- g. The responsibilities under the ANSI Standards and OSHA regulations.
- h. Detailed inspection of equipment components and systems.
- i. Fall protection system assessments and determining when a system is unsafe.
- j. Fall protection rescue procedures.
- k. The selection and use of non-engineered anchorages.
- l. Remain current with changing requirements, laws, and new fall protection systems or task applications and ensure that this policy is adhered to as written.

Locally developed training must be approved by the Fall Protection Administrator.

Competent person retraining shall occur at least every two years.

12.4 Authorized Person (User)

Training for authorized persons shall include:

- a. How to select a non-engineered anchorage that will support 5,000 pounds.
- b. How to inspect, anchor, assemble, and use the fall protection equipment commonly used in locations where they work.
- c. Fall hazard recognition.
- d. Fall hazard elimination and control methods.
- e. Applicable fall protection regulations.
- f. Their responsibilities under OSHA regulations.
- g. How to use written fall protection procedures.
- h. Inspection of equipment components and systems before use.
- i. Fall protection rescue procedures.
- j. Limits of authority relevant to fall protection.
- k. The use of applicable fall protection equipment, ensuring equipment meets OSHA and ANSI Fall Protection Standards, local fall hazards, and the employers' local equipment and systems.

The authorized person shall be retrained at least every two years unless changing workplace conditions or deficiencies are noted that would negate existing training. If new equipment is used equipment specific training can be conducted within the two year retraining period.

Appendix A – Definitions

- A.1 Anchorage** - A secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of supporting 5000 pounds per person (exception is a fall restraint system which requires an anchorage of 1000 pounds) or designed by a Qualified Person with a safety factor of 2.
- A.2 Authorized Person (User)** - Employee required to use fall protection in performance of their work and trained and certified to use fall protection PPE and systems.
- A.3 Body Harness** - Straps secured about the employee in a manner that distributes the fall arrest forces over the thighs, pelvis, waist, chest, and shoulders with means for attaching it to other components of personal fall arrest system.
- A.4 Certification** - The process to determine that criteria established by a designated standard has been met, and the documentation that records that the criteria was met. The process includes testing and is performed under the supervision of a qualified trainer or entity.
- A.5 Competent Person** - Employee trained and certified in fall protection and who is capable of identifying hazards, has the authority to take corrective actions, is knowledgeable of applicable regulations, standards, equipment, and systems, and understands the mandatory requirements for fall protection equipment and systems.
- A.6 Connector** - A device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component part of the system (such as a buckle or D-ring sewn into a body belt or body harness, or snap-hook spliced or sewn to a lanyard or self-retracting lanyard.)
- A.7 Deceleration Device** - Any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.
- A.8 Deceleration Distance** - The additional vertical distance a falling employee travels, excluding lifeline elongation and free-fall distance, before stopping from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.
- A.9 Drop Line** - A vertical line from a fixed anchorage, independent of the work surface, to which the lanyard is affixed.
- A.10 Fall Arrest System** - A system designed to stop one or more persons from striking a lower level or obstructions if a fall occurs. Fall Arrest Systems require the use of a Full Body Harness, a Connecting Means, a suitable Anchorage, planned rescue procedures, and proper training of all users.
- A.11 Fall Protection** - Any equipment, device, or system that prevents an accidental fall from elevation or mitigates the effect of such a fall.
- A.12 Fall Protection Plan** - A plan prepared by a qualified person, developed specifically for the site where work at heights is performed. The Fall Protection Plan must be maintained up to date and must meet the requirements of 29 CFR 1926.502(k).

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- A.13 Fall Protection Program** - Policy and guidelines established by an organization to protect all employees engaged in work activities exposing them to potential falls from elevation. The program covers all company facilities, jobsites, and employees of that company. The Fall Protection Program is used to develop the site-specific fall protection plan for individual jobsites.
- A.14 Fall Restraint System** - A fall protection system that prevents them from reaching an unprotected edge. The system is comprised of a body harness along with an anchorage, connectors, and other necessary equipment. The other components typically include a lanyard and may include a lifeline and other devices.
- A.15 Flight Project Activities** - Activities that involve the development or integration of flight hardware to overall payload or test equipment.
- A.16 Floor Opening** - An opening measuring 12 inches or more in its least dimension in any floor, platform, pavement, or yard through which persons may fall.
- A.17 Free Fall** - The act of falling before a personal fall arrest system begins to apply force to arrest the fall.
- A.18 Free Fall Distance** - The vertical displacement of the fall arrest attachment point on the employee's body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.
- A.19 Guardrail System** - A barrier to prevent employees from falling to lower levels.
- A.20 High Winds** - Winds with a sustained speed of 20 miles per hour or greater.
- A.21 Institutional Activities** - Routine work on items that are secured to the actual facility or are used to directly support the facility such as HVAC equipment, vacuum chambers, overhead cranes, etc.
- A.22 Lanyard** - A flexible line of rope, wire rope, or strap which has a connector at each end for connecting a body harness to a deceleration device, lifeline, or anchorage.
- A.23 Leading Edge** - The edge of a floor, roof, or formwork for a floor or other walking/working surface (such as a deck) which changes location as additional floor, roof decking, or formwork sections are placed, formed or constructed. A leading edge is considered to be an unprotected side and edge during periods when it is not actively and continuously under construction.
- A.24 Lifeline** - A component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.
- A.25 Low Slope Roof** - A roof having a slope less than or equal to 4:12 (vertical to horizontal).
- A.26 Mobile Aerial Platforms** - Equipment with the capability to move horizontally and vertically while elevated. Examples include articulating boom lifts and bucket trucks.
- A.27 Non-Engineered Anchorage** - An anchor point for which no engineering calculations have been performed.
- A.28 Non-roof Work** - Preventive maintenance (PM), repair of equipment on roofs such as heating, ventilation, and air conditioning, (HVAC), lightning protection systems, rigging of fall protection systems, etc.
- A.29 Opening** - A gap or void 30 inches (76 centimeters) or more high and 18 inches (46 centimeters) or more wide, in a wall or partition, through which employees can fall to a lower level.

- A.30 Personal Fall Arrest System** - A system used to arrest a person in a fall from a working level. It consists of an anchorage, connectors, body harness and may include a lanyard deceleration device, lifeline or suitable combinations of these.
- A.31 Positioning Device System** - A body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning. It is not a fall protection system.
- A.32 Positive Fall Protection** - Fall protection by the use of a guardrail system or personal fall protection to include harness with a fall arrest/restraint system or the use of other means such as vehicle mounted platforms and/or scaffolding.
- A.33 Program Administrator** - A person designated in writing to manage the Fall Protection Program.
- A.34 Qualified Person** - A person in possession of a recognized engineering degree and a formal training certificate from an industry recognized trainer, training center, or an equivalent OSHA training program, who has successfully demonstrated their extensive knowledge and experience to perform structural engineering for design, evaluation, and approval of fall protection systems.
- A.35 Roof Work** - The hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, vapor barrier work, and leading edge work.
- A.36 Rope Grabs** - A deceleration device that travels on a lifeline and automatically engages the lifeline, by friction, and locks to arrest the fall.
- A.37 Safety Monitoring System** - A system in which a competent monitor is responsible for recognizing and warning employees of fall hazards. The person monitoring the other workers is to be on the same walking\working surface as employees being monitored; is to be within visual sighting distance of the employees being monitored; is to be close enough to communicate orally with the employees being monitored; must not have responsibilities which could take the monitoring attention from the monitoring function.
- A.38 Scissor Lift** – Mobile scaffolding that can be manual or powered that has vertical-only capabilities. Powered scissor lifts may have minor horizontal adjustment.
- A.39 Self-Retracting Lifeline/Lanyard** - A deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.
- A.40 Steep Roof** - A roof having a slope greater than 4:12 (vertical to horizontal).
- A.41 Toe-Board** - A low protective barrier that prevents material and equipment from falling to lower levels and provides protection from falls for personnel.
- A.42 Tower** - Free-standing or guy-supported structure that is essentially vertical with access via vertical ladder or ships ladder; used to support antennas, boresite instruments, weather instruments, cameras, radars, lightning protection systems for protection of launch complexes, etc.
- A.43 Tower Climber** - Employee trained and certified as a Tower Climber and who, by possession of formal training certificate from an industry recognized trainer, training center, or an equivalent ANSI/OSHA training program, has successfully demonstrated extensive knowledge and experience to perform tower climbs.

- A.44 Unprotected Sides or Edges** - Any side or edge (except at entrances to points of access) of walking/working surface (e.g., floor, roof, ramp, or runway) where there is no wall or guardrail system at least 39 inches high.
- A.45 Walking/Working Surface** - Any surface, whether horizontal or vertical on which an employee walks or works, including but not limited to floors, ramps, bridges, runways, formwork, and concrete reinforcing steel. Does not include ladders, vehicles, or trailers on which employees are located to perform their work duties.
- A.46 Warning Line systems** - A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail or personal fall protection system to protect employees in the area.

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Appendix B – Acronyms

ANSI	American National Standards Institute
CFR	Code of Federal Regulations
FPP	Fall Protection Plan
GPR	Goddard Procedural Requirement
GSFC	Goddard Space Flight Center
NPR	NASA Procedural Requirement
NRRS	NASA Records Retention Schedules
OSHA	Occupational Safety and Health Administration
PFAS	Personal Fall Arrest System
SIA	Scaffold Industry Association

Appendix C – SAMPLE FALL PROTECTION PLAN

1. General

- a. COMPANY/PROJECT NAME shall identify and mitigate all work related fall hazards and has established methods to protect the employees from those fall hazards.
- b. Fall protection is required at all times within fifteen (15) feet of an unprotected edge with a fall hazard of four (4) feet or more. Where required, body harnesses meeting OSHA and ANSI requirements shall be used.
- c. COMPANY/PROJECT NAME will have a fall protection program administrator, name a competent person(s) (fall protection), and use a qualified person (fall protection) as required by the applicable NASA regulations and OSHA Standards. On this project, these designated persons are:
 - (1) Fall Protection Program Administrator: EMPLOYEE NAME
 - (2) Fall Protection Competent Person: EMPLOYEE NAME
 - (3) Fall Protection Qualified Person: EMPLOYEE NAME
- d. The Fall Protection Program Administrator shall identify the competent and qualified persons listed above.

2. Training

- a. All employees working at elevations shall receive training in recognition of fall hazards, hazard mitigation, and the proper use and inspection of fall protection equipment from a competent person (fall protection).
- b. The employee training described above shall be certified in writing by the employer.
- c. The latest certification documentation shall be maintained by the employer and include the name of the employee, the date of the training, areas trained and the signature of the training instructor and/or the employer.
- d. The designated competent person (fall protection) conducting training shall be qualified in the following areas:
 - (1) The nature of fall hazards in the work area.
 - (2) The correct procedures for installing, inspecting, and disassembling fall protection systems.

- (3) The use and operation of fall protection systems to be used.
- (4) Each employee's role in the safety monitoring system, if this system is to be used.
- (5) The limitations on the use of mechanical equipment on low-slope roofing jobs.
- (6) The correct procedures for the handling and storage of equipment and materials and installation of overhead protection.
- (7) Each employee's role in the fall protection plan.
- (8) The OSHA fall protection standard.
- e. If **COMPANY NAME** verifies and accepts training provided by another employer, the certification shall indicate the date **COMPANY NAME** determined the prior training was adequate rather than the date the training was performed.

3. Retraining of Employees

- a. Employees suspected of not having the understanding or skills required shall be retrained.
- b. Other circumstances that require retraining include:
 - (1) Changes in the workplace that make earlier training obsolete.
 - (2) Changes in the types of fall protection systems used.
 - (3) Observed inadequacies in an employee's use or understanding of fall protection systems.

4. Fall Protection Equipment

- a. Fall protection equipment shall meet all OSHA, applicable ANSI, and manufacturer requirements for use, and be properly stored when not in use.
- b. All fall protection equipment shall be inspected by the user before each use and by a competent person (fall protection) annually in accordance with applicable regulatory standards or per manufacturer's recommendations, whichever is more stringent.
- c. Annual inspections of fall protection equipment shall be documented and meet the following criteria:
 - (1) All fall protective equipment to include safety harnesses, drop lines, lifelines, fall arrest, as well as positioning lanyards, ladder safety climb, and rigid rail sleeves (e.g., Skate's, Rope Grabs) shall be inspected.

- (2) Self-retracting lanyards shall be visually inspected and checked according to the manufacturer's recommendations to ensure there are no obvious signs of damage due to wear and tear.
- (3) All equipment shall have a manufacturer's serial number on it (e.g., tag, webbing) or it will be serialized by using a method not destructive to the equipment.
- (4) Maintenance servicing must only be completed by the manufacturer's approved service technician, trained to repair and service their equipment.
- d. A documented equipment tracking system that uses the method identified from 4.c (3) above shall be used.
- e. Any fall protection equipment that is missing an inspection tag or is past due for annual inspection shall be immediately removed from service.

5. List of Attachments

- a. List of identified fall hazards.
- b. List of all protection methods to be used to protect employees from the identified fall hazards.
- c. List of controls, limitations, constraints, and procedures to be used with the fall protection methods.
- d. List of employees trained and authorized to work in areas where fall protection is required.
- e. Written certification of fall protection training for each employee.
- f. A signature page where every employee authorized to work under the plan signs to indicate that they have read and understood the plan.

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CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
Baseline	08/01/2011	Initial Release
-	11/04/2011	Administrative Change to delete Physical Reports from P.8 Section.
A	02/23/2015	Changed: Authorized user refresher training to every 2 years, use of fall protection in scissor lifts only when the manufacturer requires it, separated mobile aerial platform and scissor lift sections for clarity, low slope roof work without fall protection changes from 6 feet from the edge to 15 feet.